

PUMPING PLANT EFFICIENCY TEST  
ELECTRIC

SWCD \_\_\_\_\_ FIELD OFFICE \_\_\_\_\_

COOPERATOR \_\_\_\_\_ ENG. JOB CLASS \_\_\_\_\_ LOCATION \_\_\_\_\_

PROGRAM \_\_\_\_\_ CONTRACT NO. \_\_\_\_\_ CIN \_\_\_\_\_ FIELD NO. \_\_\_\_\_

EVALUATED BY \_\_\_\_\_ DATE \_\_\_\_\_ WELL I.D. \_\_\_\_\_

1. WELL YIELD = \_\_\_\_\_ GPM

2. ACRE INCHES/HOUR

= \_\_\_\_\_ GPM

450 GPM/AC.IN./HR.

= \_\_\_\_\_ AC. IN./HR

3. POWER CONSUMPTION

$$\frac{(3.6) (\text{Kh factor}) (\text{Revolutions})}{\text{Time (Sec.)}}$$

= (3.6) ( \_\_\_\_\_ ) ( \_\_\_\_\_ Rev.)  
( \_\_\_\_\_ Sec.)

= \_\_\_\_\_ Kw per hour

4. POWER COST PER HOUR

= ( \_\_\_\_\_ Kw per hour) (\$ \_\_\_\_\_ per Kw)  
= \$ \_\_\_\_\_ per hour

5. POWER COST PER ACRE INCH

= \$ \_\_\_\_\_ per hour  
= \_\_\_\_\_ ac-in/hour  
= \$ \_\_\_\_\_ per ac-in

6. PUMPING LIFT

A. Static water level = \_\_\_\_\_ ft  
B. Drawdown = \_\_\_\_\_ ft  
C. Total pumping lift = \_\_\_\_\_ ft

7. TOTAL DYNAMIC HEAD

A. Total pumping lift = \_\_\_\_\_ ft  
B. Discharge pressure = ( \_\_\_\_\_ psi) (2.31)  
= \_\_\_\_\_ ft  
C. Column pipe head loss (estimate) = \_\_\_\_\_ ft  
D. Total dynamic head = \_\_\_\_\_ ft

8. WATER HORSEPOWER

$$\begin{aligned} &= \frac{(\text{Total dynamic head}) (\text{GPM})}{3960} = \frac{(\quad \text{ft}) (\quad \text{GPM})}{3960} \\ &= \quad \text{Water HP} \end{aligned}$$

9. INPUT HORSEPOWER

$$\begin{aligned} &= (\quad \text{Kw per hour}) (1.34 \text{ HP per Kw}) \\ &= \quad \text{Input HP} \end{aligned}$$

10. OVERALL EFFICIENCY

$$\begin{aligned} &= \frac{(\text{Water HP}) (100)}{\text{Input HP}} = \frac{(\quad \text{HP}) (100)}{\quad \text{HP}} \\ &= \quad \% \end{aligned}$$

11. PERFORMANCE COMPARISON

$$\begin{aligned} &= \frac{(\text{Overall Efficiency}) (100)}{66\%} = \frac{(\quad) (100)}{66\%} \\ &= \quad \% \end{aligned}$$

12. PUMP EFFICIENCY

$$\begin{aligned} &= \frac{\text{Overall Efficiency} (100)}{\text{Motor Efficiency (see table below)}} \\ &= \frac{(\quad \%) (100)}{\quad \%} \\ &= \quad \% \end{aligned}$$

STANDARD ELECTRIC MOTOR EFFICIENCIES

<u>Submersible</u>	<u>Vertical Hollow Shaft</u>	<u>V-Belt Drive</u> (motor only)
All motors 80%	10-100 HP - 90%	10-40 HP - 88%
	100-150 HP - 91%	40-125 HP - 89%
	150-300 HP - 92%	125-300 HP - 92%

13. ANNUAL ENERGY COST

$$\begin{aligned} &= (\text{Fuel cost/hour}) (\text{Hours operated/yr}) \\ &= (\$ \quad) (\quad \text{hrs}) \\ &= \$ \quad \end{aligned}$$

14. POTENTIAL PERCENT SAVINGS =

100 - Performance Comparison

= 100 -  $\frac{\text{ } \quad \quad \quad}{\text{ } \quad \quad \quad} \%$

=  $\frac{\text{ } \quad \quad \quad}{\text{ } \quad \quad \quad} \%$

### 15. DOLLAR SAVINGS PER YEAR

$$= \frac{(\text{Annual Energy Cost}) (\text{Potential Percent Savings})}{100}$$
$$= \frac{(\$ \quad \quad \quad) (\quad \quad \%)}{100}$$
$$= \$ \underline{\hspace{2cm}}$$

16. COST PER ACRE FOOT PER FOOT OF TOTAL DYNAMIC HEAD

$$= \frac{(\text{Cost per acre inch})(12)}{\text{TDH}} = \frac{(\$ \quad)(12)}{\quad \text{ft}}$$

$$= \$ \quad \text{per foot of dynamic head}$$

## 17. RECOMMENDATIONS

[illegible]

PUMP AND MOTOR DATA

<u>Pump</u>	<u>Gearhead</u>
Mfr. _____	Mfr. _____
Model _____	Gear Ratio _____
Serial No. _____	Serial No. _____
Pump Setting _____	RPM _____
Column Dia. _____	
Discharge Dia. _____	
<u>Screen Design</u>	<u>Belt Drive</u>
Length _____	Dia. Drive Pulley _____
Year Installed _____	Dia. Pump Pulley _____
Year Repaired _____	

<u>Motor or Engine</u>	<u>Meter</u>
Mfr. _____	Meter No. _____
Model _____	Kh Factor _____
Serial No. _____	Gas Correction _____
Volts _____	Factor _____
Amps _____	
Service Factor _____	
CID _____	
Compression Ratio _____	
HP _____	
RPM _____	

<u>Well</u>	
Depth _____	Well Dia. _____
Casing Dia. _____	Gravel Packed _____
Static Water Level _____	Pumping Water Level _____
Year Drilled _____	Driller _____

<u>Cost Analysis</u>		
	Before Repair	After Repair
Well Yield, GPM	_____	_____
Total Dynamic Head, Ft	_____	_____
Input HP	_____	_____
Water HP	_____	_____
Pump Efficiency	_____	_____
Overall Efficiency	_____	_____
% Change in Overall Eff	_____	_____
Hours Operated Annually	_____	_____
Cost per Acre Inch	_____	_____
Cost per Ac Ft/Ft of TDH	_____	_____
Annual Energy Cost	_____	_____
Annual Energy Savings	_____	_____
Percent Savings	_____	_____